

EPIDEMIOLOGICAL PROFILE OF MOTORCYCLE ACCIDENT VICTIMS IN UNIVERSITY HOSPITAL

PERFIL EPIDEMIOLÓGICO DE VÍTIMAS DE ACIDENTES DE MOTO EM HOSPITAL UNIVERSITÁRIO

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ABSTRACT

Objective: To evaluate the epidemiological profile of motorcycle accident victims in a metropolis with more than one million inhabitants attended in a university hospital of reference in 2017. **Methods:** a retrospective study through the analysis of medical records of 105 motorcycle accident victims in Campinas (SP) attended in a university hospital of reference and who needed surgical procedure in 2017. **Results:** 87 patients (82.9%) were men. Multiple fractures were observed in 61 patients (58.1%) and polytrauma was found in 14 patients (13.3%). Tibial fracture was the most frequent, present in 65 cases (61.9%). Exposed fractures occurred in 68 patients (64.7%). Among the polytrauma victims, the most frequent injury was traumatic brain injury (TBI), present in seven patients (6.6%). The mean age was 29.8 years (range 6-63 years). The average length of hospital stay was 14 days (1-87). **Conclusion:** It is essential to investigate and evaluate the victims' epidemiological profile, as well as the resulting injuries, in order to provide adequate support for the implementation of measures aimed at primary prevention and awareness of the most affected groups. **Level of Evidence II, Prognostic studies – Investigating the effect of a patient characteristic on the outcome of disease.**

Keywords: Accidents, Traffic. Health Profile. Multiple Trauma. Craniocerebral Trauma.

RESUMO

Objetivo: Avaliar o perfil epidemiológico das vítimas de acidentes motociclísticos ocorridos em uma metrópole com mais de 1 milhão de habitantes atendidas em um hospital universitário de referência no ano de 2017. **Métodos:** Estudo retrospectivo através da análise de prontuários de 105 vítimas de acidentes motociclísticos ocorridos em Campinas, SP, Brasil, no ano de 2017 atendidas em um hospital universitário de referência que necessitaram de procedimento cirúrgico. **Resultados:** Oitenta e sete pacientes (82,9%) eram do sexo masculino. Foram verificadas polifrações em 61 pacientes (58,1%) e politraumatismo em quatorze (13,3%). A fratura de tíbia foi a mais frequente, presente em 65 casos (61,9%). Fraturas expostas ocorreram em 68 pacientes (64,7%). Entre as vítimas de politraumatismo, a lesão mais recorrente foi o traumatismo cranioencefálico (TCE), presente em sete pacientes (6,6%). A média de idade foi 29,8 anos (variando de 6-63 anos). O tempo de internação médio foi 14 dias (1-87). **Conclusão:** É fundamental investigar e avaliar o perfil epidemiológico das vítimas, assim como os agravos resultantes, de modo a propiciar subsídio adequado para implementação de medidas de prevenção primária e conscientização, especialmente direcionadas para os grupos mais acometidos. **Nível de Evidência II, Estudos prognósticos – Investigação do efeito de característica de um paciente sobre o desfecho da doença.**

Descritores: Acidentes de Trânsito. Perfil de Saúde. Traumatismo Múltiplo. Traumatismos Craniocerebrais.

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INTRODUCTION

Traffic accidents are considered a major problem for public health in the world, being one of the main causes of morbidity and mortality. According to the World Health Organization (WHO), about 1.2 million people die each year from traffic accidents worldwide, of which

90% are concentrated in low- or medium-development countries.¹

In Brazil, it is estimated more than 980,000 deaths following traffic trauma between 1980 and 2011.²

From 1998 to 2010, the motorcycle fleet growth in Brazil was 490%, jumping from 2,800,000 to 16,500,000, supported by government

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The study conducted at the Pontifícia Universidade Católica de Campinas, Centro de Ciências da Vida, Faculdade de Medicina, Campus II.

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policies that stimulated manufacturing, reduced the cost, and enabled the financing of these vehicles. It is important to highlight that, in the same period, the automobiles general fleet growth was 160%, which indicates a growth three times higher in the number of motorcycles.¹

Motorcyclists are one of the most susceptible and likely groups to engage in traffic accidents. When compared with other means of locomotion, having a motorcycle has its benefits, such as easy travel capacity on congested roads, low purchase price and maintenance cost, and fuel economy, in addition to its increasing use in the labor market (motorcycle taxi and deliveries). Therefore, the motorcycle use in Brazil has been increasing significantly.^{1,3}

Associated with this significant increase in motorcycles in circulation, the mortality involving motorcyclists in Brazil grew by 700% from 1998 to 2008, thus being responsible for a substantial increase in the number of hospitalizations in public services. In 2000, 16,692 hospitalizations were recorded. In 2005, this number grew to 30,562 (83%).³ Thus, the need for new public policies in order to reduce traffic accidents is evident.

Regarding the epidemiological profile of motorcycle accidents, many studies indicate the young male population is the most vulnerable, and head and lower limb injuries are the most prevalent. In addition, obese motorcyclists have longer length of hospital stay and different body injuries when compared with normal weight motorcyclists.⁴⁻⁶ Thus, safety measures, such as the use of appropriate helmets and clothing are extremely important for injury protection, reduced length of hospital stay, prevention of physical disability, and for the economy of social costs, reducing the need for institutional care.^{7,8} Therefore, in order to reduce the number of victims involved in motorcycle accidents, traffic accidents should be treated as a health promotion issue, with the development of intersectoral projects to stimulate the participation of the entire population and the adoption of more supportive behaviors, which aim both at traffic education and information on the physical consequences of motorcycle accidents.⁹ Furthermore, improving the infrastructure of streets and roads is crucial for the proper movement of motor vehicles. This study aims to evaluate the epidemiological profile of motorcycle accident victims that occurred in a metropolis with more than one million inhabitants attended in a university hospital of reference in 2017.

METHODS

This is a retrospective cross-sectional study conducted at the PUC-Campinas Hospital, filed by the Research Ethics Committee with registration on *Plataforma Brasil* under the number 88812818.3.0000.5481, in which the analysis of medical records of 105 patients, who were motorcycle accident victims in Campinas, São Paulo, Brazil, were performed in 2017 (from January to December 2017). The patients were treated primarily in the emergency room of a university hospital of reference and required surgical procedure.

The following characteristics were evaluated: sex, age, length of hospital stay, type and frequency of injuries (fractures, multiple fractures, and polytraumas), and infection occurrence.

Data were analyzed from medical records listed in the Orthopedics and Traumatology service of the PUC-Campinas Hospital. All study participants signed an informed consent form.

RESULTS

Among the 105 analyzed patients, 87 (82.9%) were men and 18 (17.1%) were women. The mean age was 29.8 years (range 6-63 years). Among all victims, 61 (58.1%) had multiple fractures and 14 (13.3%) presented polytrauma. Tibia fracture was the most common,

present in 65 cases (61.9%), followed by femur and fibula fractures, with 30 cases each (28.5%), and radio and humerus fracture, with six cases (11.4%). Exposed fractures occurred in 68 patients (64.7%). Among the polytrauma victims, the most frequent injury was traumatic brain injury (TBI), present in seven patients (6.6%); followed by pulmonary injuries, with six cases (5.7%); urinary tract injury, with four cases (3.8%); and liver, splenic, and testicular injuries, with one case each (1%). Besides, among the polytraumatized patients, 12 of them (11.4%) also suffered multiple fractures. Infections were observed in 49 patients (46.6%). The mean length of hospital stay was 14 days, with a minimum stay of one day and a maximum of 87 days.

DISCUSSION

Data from the literature indicate a predominance of motorcycle accidents involving men, ranging from 79% to 96%.¹⁰ This study confirmed these data, with a prevalence of 82.9% male patients. The greater involvement of male motorcyclists is related to risky driving behavior and disrespect for the traffic laws, since data indicate most accidents occur due to motorcyclists' carelessness.^{10,11} Regarding the age group, 63.8% of the patients were aged between 11 and 35 years. In a study conducted in Piauí, 74.4% of those injured were aged 10 to 39 years.¹¹ Other studies indicate that the predominant victims involved in fatal motorcycle accidents are young people from the age group of 15 to 29 years.⁴

The higher occurrence of accidents among young people and adolescents is related to relevant socioeconomic factors. First, motorcycles represent an alternative of lower cost, greater agility, and independence for young people when compared with public transportation.⁴ Associated with this, young people generally present risky driving behavior and have less experience and driving skills.¹⁰ Another relevant point in this study is the presence of underage individuals involved in motorcycle accidents. There were 10 victims aged between 14 and 17 years, and the minimum age determined by Brazilian legislation for drivers' qualification is 18 years old. Data on the position of the victims regarding the accident (driver or passenger) were not collected, but it is believed that among those patients mentioned above, not all were passengers. This fact shows the need for better investigation regarding motorcycle riding by unqualified individuals and its impact on traffic accidents. In a study conducted in the municipality of Campinas,⁴ we found that the number of traffic accidents with victims increased after 2004, mainly due to the significant motorcycle fleet growth. Likewise, a mortality growth involving motorcyclists was also observed.

Regarding the injuries found, the most frequent ones were those of the lower limbs, mainly represented by tibia fractures, which were observed in 65 patients (61.9%). Koizumi found that the lower limbs are the most affected in motorcycle accidents, representing about 29.8% of them, followed by head injuries (21.5%).¹² The highest incidence of injuries in the lower limbs is directly related to lower protection and greater exposure of these body areas in motorcyclists as opposed to the head, which is protected by helmet.¹³ However, Koizumi points out that the frequency of injuries by body region changes in patients who died, being more observed in patients who suffered head lesions, followed by abdominal, lower limb, and pelvic lesions.¹²

It is noteworthy that no data were collected regarding patients who died. However, we observed that seven patients (6.6%) were victims of TBI, which is among the most frequent fatal injuries, with high severity, in addition to a high degree of disability.^{10,12,14} The importance of wearing helmets for TBI prevention stands out, with studies showing the significantly higher occurrence of this condition in individuals who do not use any safety equipment.¹²

In this study, multiple fractures occurred in 61 (58.1%) victims. These data directly focused on the length of hospital stay, on average 14 days, with a minimum of one day and a maximum of 87 days, since orthopedic patients are among those who contribute the most to increasing the length of hospital stay. Koizumi established 15.8 days of average hospitalization.¹² Long length of hospital stay is directly associated with greater trauma severity and with the occurrence of infectious complications. In this study, 49 patients (46.6%) presented infection during the hospitalization. Araújo and Whitaker point out that patients who suffered motorcycle accidents and evolved with complications have longer hospitalization time, mainly because of infectious situations, such as surgical site infection, and pressure ulcer.¹⁵

This study has a limitation regarding the methodology applied, as it was a retrospective analysis, dependent on medical records

information. Therefore, it was impossible to confirm any information not completed in the patient records.

The identification of the epidemiological profile of patients involved in motorcycle accidents and the development of preventive measures are of outstanding importance, given the seriousness of the resulting injuries, with high morbidity and mortality, and the demand to health services.

CONCLUSIONS

Given the significant motorcycle fleet growth, the high incidence of traffic accidents involving these vehicles, especially among young male individuals, and the resulting high morbidity and mortality rates, it is essential to investigate and evaluate the victims' epidemiological profile, as well as their resulting injuries, in order to provide adequate support for the implementation of measures aimed at primary prevention and awareness of the most affected group.

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